Symposium: What's new in mouth-rinse nutrition?
Session: Update on fluid and menthol
Speaker: Russ Best

This session will provide an update on the perceptual, physiological and performance effects of menthol mouth swilling during exercise performance, and the associated mechanisms underpinning these changes. Cooling stimuli applied to the oral cavity impart feelings of freshness that are familiar to users of oral hygiene and other menthol containing products, such as confectionary or oral analgesics, this sensation can be imparted by either physiological or perceptual cooling. Cold fluids provide a cooling sensation by stimulating oral cold receptors, and can attenuate thirst through post-absorptive mechanisms; menthol mimics the provision of oral cooling stimuli, by acting as a cold-receptor agonist to TRPM8 channels, and trigeminal and cold-sensitive neurons in the face and oral cavity. This invokes perceived thermal changes in congruence with an environmental temperature range of 8-28°c, the magnitude of which is inversely proportional to the thickness of the stratum corneum in the region that menthol is applied. Hence, the oral application of menthol and cold fluids may lower individuals' thermal sensation, improve thermal comfort and attenuate thirst, independent of physiological changes in temperature. This attenuation of thermal symptoms may be perceived as hedonic, and concomitantly improve exercise performance. To date literature has focused on endurance exercise performance in hot environmental conditions, with menthol mouth swilling improving time to exhaustion performance in cyclists, and time trial performance in runners and triathletes. Menthol may also provide an additive perceptual cooling stimulus when applied alongside physiological cooling strategies, in a temperature dependent manner. There are limited data pertaining to menthol mouth swilling and power related activities at present. The timing of menthol throughout the exercise bout may affect its ergogenic properties, but this research is also in its preliminary stages. Future research should aim to individualise menthol mouth swilling based upon personal preference and sensitivity; further personalisation of swilling strategies may be achieved by investigating the timing of swilling during the exercise bout and utilising menthol in conjunction with other ergogenic nutritional strategies. The possibility of habituation to menthol mouth swilling also warrants investigation.

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